Essays on Teaching Excellence

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Why Knowing About Disciplinary Differences Can Mean More Effective Teaching

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Most faculty members are probably comfortable with the notion that their disciplinary background deeply influences not only what they teach but how they teach. And, indeed, a growing body of literature suggests that there is a host of effects--including level of commitment to teaching, views of students, and even teaching evaluation ratings--associated with disciplinary differences. This essay draws on that growing body of research to suggest ways of becoming more conscious of the way disciplinary training and orientation influence teaching.

Disciplinary Clusters and Views of Teaching

One particularly interesting line of research, summarized by Braxton and Hargens (1996), concentrates on dividing the disciplines into meaningful clusters and comparing these clusters in terms of faculty's various academic roles and behaviors, including teaching. Very roughly speaking, the analyses by Anthony Biglan (1973a and b), David Kolb (1981), and Tony Becher (Becher & Trowler, 2001) have suggested that fields can be meaningfully classified by degree of scholarly consensus (with the highest consensus considered "hard" and lower consensus "soft") and their orientation to pure or applied research. This results in a useful four-fold clustering:

hard/pure (e.g., physics, biology, mathematics, chemistry), soft/pure (e.g., psychology, history, philosophy, anthropology), hard/applied (e.g., engineering, agriculture, computer science), and soft/applied (e.g., education, accounting, journalism, nursing). Use of these clusters allows researchers to explore how faculty in different disciplines display differences in their behaviors and attitudes.

Some of the insights gleaned from this approach seem obvious, a reflection of the objective reality of the disciplines. For example, "Faculty in high-consensus fields were more likely to use teaching assistants than those in low-consensus fields" (Braxton & Hargens, 1996, p. 33). (Because introductory science and mathematics courses usually draw larger numbers of students than introductory history or philosophy courses, there's a greater need for TAs in those courses.) But other findings are more interesting and likely to be useful to young faculty in the process of developing their careers or even experienced faculty attempting to be more reflective about their teaching. For example, Braxton and Hargens (1996) cited the research of Kenneth Feldman reporting that the relationship between teaching and research in low-consensus fields is at least moderate while in high-consensus fields it is insignificant. A young university teacher in physics or chemistry may benefit from knowing that she may have to work hard to make her teaching and research responsibilities mesh. Similarly, faculty members from a low-consensus field may put a high value on contributing to students' overall intellectual development. They should know, however, that if they are team-teaching with someone from a high-consensus field, that colleague is much more likely to concentrate on teaching content.

But interesting as some of these studies have been, will they in fact contribute to better teaching? Perhaps their strongest merit is that so many choices faculty make about the design of courses, assumptions about students, and selection of teaching methods are unexamined, not poor or wrong, but simply unexamined. These studies might encourage faculty members to reconsider some of what their disciplinary training makes them take for granted.

The Scholarship of Teaching and Learning

What would it look like if the disciplinary context were the subject of careful reflection rather than the assumed background of one's pedagogical efforts? In its broadest sense, it would mean becoming a practitioner of what the Carnegie Foundation for the Advancement of Teaching--and many others--refer to as the scholarship of teaching and learning (SOTL). It would entail bringing to teaching the same rigor of inquiry and the same commitment to public sharing, critique, and evaluation of pedagogical practice as to research. The Carnegie web site (see especially http://gallery.carnegiefoundation.org/) and its publications (Huber & Morreale, 2002; Hutchings, 2000; Shulman, 2004a and b) provide many examples of the exciting materials emerging from the careful nurturing of the scholarship of teaching and learning.

Examining Unexamined Assumptions about Teaching

But for faculty worried about the time and effort that a serious commitment to SOTL entails, are there faster and easier ways to use the disciplinary lens to strengthen one's teaching? We draw here from the work on pedagogical content knowledge, i.e., the knowledge of how to teach a particular field, (see, for example, Lee Shulman, 2004a and b, and Lisa Lenze ,1995) to guide us in questioning our assumptions about our usual discipline-based approach to teaching.

Perhaps one of the most dangerous assumptions is that students may have needs, interests, or abilities similar to those we had when we were studying the field. In private consultations faculty often tell us that they design lectures with themselves as a student in mind. For the few faculty who really struggled in their chosen discipline, such an approach can work. But for the vast majority of faculty to teach with themselves in mind is to imagine their least likely audience. Far better is assuming that students have quite different interests and abilities and providing them the opportunity to tell about themselves. A classroom assessment technique called the background probe (Angelo & Cross, 1993) is especially handy for this purpose.

A safer assumption about students is that any discipline has certain key ideas that are difficult to master; faculty need to pay particular attention to these concepts as they plan their courses. Here the SOTL

can make a particularly useful contribution to better teaching by encouraging faculty to share their strategies for making difficult concepts--such as Fourier transform in engineering, comparative advantage in economics, and thesis statement in English--understandable. In addition to identifying such concepts and focusing on the development of materials to elucidate them, faculty could also make a particular effort to give students early opportunities to test their mastery of these ideas, whether through classroom assessment techniques, assignments, quizzes, or other means.

Another assumption is that students enter courses already convinced of the importance of the subject area. Many faculty forget that in many cases students take courses mainly to fulfill general education or major requirements, to test their potential interest in the subject or, simply, because they think it will help them get a job later. In all these cases, instructors need to help students understand why a given field deserves their attention. Once faculty accept this attitude, they develop some of their most interesting and satisfying teaching materials. For one faculty member, it meant telling the fascinating stories of blind alleys in the field; for another it meant the construction of complicated 3-D models; and for the third it meant setting up elaborate simulations of real world diplomatic negotiations.

Thinking more consciously about the disciplines will also mean taking a fresh look at teaching methods. Humanists take discussions for granted; for scientists it is generally lectures and laboratories. But what happens when faculty are willing to look beyond their discipline for models that engage and stimulate students? One of the young humanists on the Stanford campus, an amazingly successful teacher already, launched a discussion with his fellow humanists by telling them ten things he had learned from scientists, engineers, and social scientists, such as the importance of frequent assignments, email office hours, having students do concept maps at the beginning and end of the course to help them realize how much they'd learned, required office visits, and on and on. He hadn't adopted any of these techniques whole cloth, but he'd adapted each successfully to enrich his own teaching of music. Had he insisted on staying within disciplinary borders, neither he nor his students would have benefited

from any of these successful learning experiments.

Conclusion

Let us end with a plea to respect the importance of the disciplines and to continue to learn about them and accommodate them fully in our work with and as faculty. But let us also realize their limitations and their role in the assumptions that keep us from the fullest engagement of our students as learners.

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